

REMARKS

Claim 1 has been amended to add an aspect of hydrogen bonding between layers, as disclosed on pages 32-34.

The claims have been amended to replace “urethane” with “polyurethane” in each instance, as “polyurethane” is believed to be a standard name for the material. The scope of the claims is unaffected by this change.

Claims 4, 6, and 7 have been amended to correct the language used to describe the ranges in these claims. As pointed out by the Examiner, a range may be “from n1 to n2” or “between n1 and n2”, but not “between n1 to n2”.

Claim 5 has been amended to correct the reference to the capture gas constituent.

With these amendments, claims 1-10 remain pending.

Rejection for Obviousness-Type Double Patenting

Claim 1 stands rejected for obviousness-type double patenting over claim 1 of US 6,599,597 in view of the Moureaux and Taylor patents.

The present application is a divisional of 10/377,540 filed 2/2/03 (now US 6,730,379), which is a divisional of 09/170,790 filed 10/13/98 (now US 6,599,597), which is a continuation of 08/475,276, filed 6/7/95.

The Taylor patent, filed July 20, 1999, is not prior art to this application, which claims priority back to June 7, 1995. Thus, obviousness has not been shown on this ground.

Further, during prosecution of US 6,599,597, a restriction requirement was applied to the claims. The USPTO determined that the claims elected and prosecuted in that application claimed an invention that was distinct from the claims to a cushioning device, which were

restricted out and required to be cancelled. Those claims have been taken up in the present application.

Thus, the USPTO has already determined that the present claims are patentable over those of the parent US 6,599,597. It is respectfully submitted that the present rejection is improperly made following a restriction requirement between the respective claims of this application and the cited patent, and should be withdrawn. Accordingly, Applicants respectfully request reconsideration of the claims.

Rejection Under 35 U.S.C. § 112

Claims 4 and 5 stand rejected under section 112, second paragraph, as indefinite. This rejection is traversed with respect to the amended claims.

Applicants have amended the claims to correct the errors in these claims noted by the Examiner. Accordingly, it is believed that the rejection should now be withdrawn. Reconsideration of the claims as amended is respectfully requested.

Rejection Under 35 U.S.C. 102(b) over Moureaux

Claims 1-3, 5, 6, 9, and 10 have been rejected as anticipated by Moureaux, US Patent 5,036,110. Applicants respectfully traverse the rejection and request that the claims be reconsidered.

Applicants understand the Moureaux reference to disclose a membrane that includes a film formed from a graft polymer that is the reaction product of a thermoplastic polyurethane with a copolymer of ethylene and vinyl alcohol, with this film being sandwiched between two

layers to form a laminate. Col. 2, lines 40-43; col. 6, lines 10-16. The graft polymer is formed by mixing the thermoplastic polyurethane and the copolymer at high temperatures, col. 3, lines 54-56, such that the copolymer is covalently linked to the thermoplastic polyurethane by reaction of the isocyanate groups of the polyurethane with the hydroxyl groups of the ethylene-vinyl alcohol copolymer to form urethane linkages. Col. 4, lines 5-27.

The amount of ethylene-vinyl alcohol copolymer is 5-20%, col. 2, lines 25-29 & claim 3, and thermoplastic urethane 50-95%, col. 2, lines 36-39. The result is a film in which the graft copolymer, including the ethylene vinyl alcohol, is embedded into the body of the thermoplastic urethane. Figure 1; col. 2, line 66 through col. 3, line 2; claim 9.

The membrane is then formed by sandwiching the graft polymer layer between two layers of a material selected from thermoplastic polyurethane, block amide polyethers, flexible polyesters, or mixtures thereof. Col. 1, lines 62-65; col. 2, lines 40-43; col. 6, lines 10-17 & 45-52.

Each of the present claims is patentable over the Moureaux reference because the Moureaux reference fails to teach, mention or suggest hydrogen bonding between layers of a barrier membrane. More specifically, the Moureaux reference does not teach, mention, or suggest hydrogen bonding between a copolymer of ethylene-vinyl alcohol (EVOH) of a first layer and a thermoplastic polyurethane (TPU) of a second layer. In fact, the Moureaux reference teaches a first layer in which its copolymer of ethylene and vinyl alcohol is imbedded as islets in a layer of polyurethane and thus is not in contact with and further membrane layers. Moreover, there is nothing in the Moureaux reference suggesting the desirability, or expectation of success, in producing a composite membrane having hydrogen bonding between layers.

The Moureaux reference fails to disclose or suggest the hydrogen bonding required by the present claims. The Moureaux reference instead describes a membrane with a layer of a graft copolymer (that is, one in which the bonds formed are covalent) of a polyurethane and a copolymer of an ethylene and a vinyl alcohol (EVOH copolymer). The EVOH copolymer, as part of the graft copolymer, is embedded into the polyurethane. Figure 1; col. 1, lines 66-68; col. 5, lines 62 to col. 6, line 1; claim 9. Therefore, Applicants believe no hydrogen bonding could occur between the EVOH embedded in the graft polymer layer and the two outside TPU layers. In contrast, the present invention teaches that the EVOH copolymer is present at the layer surface and that hydrogen bonding between the layer containing the EVOH copolymer and the layer containing the TPU results. Specification, page 32, line 6 to bottom of page 33.

Nor would it be obvious to modify the Moureaux reference to make a barrier membrane in which the layers are hydrogen bonded together because Moureaux teaches away from hydrogen bonding between the layers by teaching that the EVOH is imbedded in the layer and, further, that the bonding between the EVOH and the polyurethane of its own layer is covalent, not hydrogen bonding. Thus, the Moureaux reference, if anything, teaches away from hydrogen bonding between the EVOH of one layer and the polyurethane of another layer.

Claims 2 and 6, which are directed toward embodiments of the invention that include 30 weight percent or less thermoplastic polyurethane in the first layer, are separately patentable over the Moureaux reference because the Moureaux reference teaches that the thermoplastic polyurethane in the graft-polymer layer should be between 50 and 95 weight percent and that the ethylene vinyl alcohol is embedded into the body of the thermoplastic urethane.

Claim 2 includes a limitation of 30 weight percent or less of polyurethane in the first layer. In contrast, the Moureaux reference teaches that its graft polymer layer has between 50

and 95 weight percent polyurethane. Col. 2, lines 36-39. Further, the Moureaux reference teaches, and requires, that the ethylene vinyl alcohol copolymer of the graft polymer layer is embedded into the body of the thermoplastic polyurethane. Fig. 1; col. 5, line 62 to col. 6, line 9 & 28-31; col. 8, lines 19-22; claim 12. Thus, again, the ethylene vinyl alcohol copolymer is a minor portion and the thermoplastic polyurethane is a major portion of the graft copolymer layer.

Claim 6 is dependent on claim 2 and includes a limitation of about 5 to about 25 wt. % aliphatic thermoplastic polyurethane, and so is patentable over Moureaux for the same reasons as is claim 2.

Because the Moureaux reference teaches that the polyurethane is more than 50 weight percent of the graft copolymer layer, Applicants submit that claim 2, in which the polyurethane is 30 weight percent or less of the first layer, is separately patentable over the Moureaux reference.

Claim 9, which is directed toward gas-filled cushioning devices in which the first layer includes between 50 and 97 weight percent of ethylene-vinyl alcohol copolymer, is separately patentable over the Moureaux reference because the Moureaux reference teaches that the amount of ethylene-vinyl alcohol copolymer in its graft-polymer layer is 5 to 20 weight percent and that the ethylene vinyl alcohol is embedded into the body of the thermoplastic polyurethane.

Claim 9 recites between 50 and 97 weight percent of ethylene-vinyl alcohol copolymer in the first layer. In contrast, the Moureaux reference teaches that its graft polymer layer has 5 to 20 weight percent ethylene-vinyl alcohol copolymer. Col. 2, lines 25-29; col. 3, lines 51-53; claim 3. Further, the Moureaux reference teaches, and requires, that the ethylene vinyl alcohol copolymer of the graft polymer layer is embedded into the body of the thermoplastic urethane. Fig. 1; col. 5, line 62 to col. 6, line 9 & 28-31; col. 8, lines 19-22; claim 12. Thus, again, the

ethylene vinyl alcohol copolymer is a minor portion and the thermoplastic polyurethane is a major portion of the graft copolymer layer.

Because the Moureaux reference teaches that the ethylene-vinyl alcohol copolymer is 5 to 20 weight percent of the graft copolymer layer, Applicants submit that claim 9, in which the ethylene-vinyl alcohol copolymer is 50 to 97 weight percent of the first layer, is separately patentable over the Moureaux reference.

The Moureaux patent thus fails to anticipate the present claims. Accordingly, Applicants respectfully request withdrawal of the rejection and reconsideration and allowance of the rejected claims.

Rejection Under 35 U.S.C. 103(a) over Moureaux

Claim 4 has been rejected as unpatentable over Moureaux, US Patent 5,036,110.

Applicants respectfully traverse the rejection and request reconsideration of the claim.

Claim 4, dependent on claim 1, is patentable over the Moureaux patent for the same reasons as discussed above.

Claim 4 is thus patentable over the Moureaux patent. Accordingly, Applicants respectfully request withdrawal of the rejection and reconsideration and allowance of claim 4.

Rejection Under 35 U.S.C. 103(a) over Moureaux in View of Matsumoto

Claim 7 has been rejected as unpatentable over Moureaux, US Patent 5,036,110 in view of Matsumoto et al., U.S. Patent 4,410,595. Applicants respectfully traverse the rejection and request reconsideration of the claim.

Claim 7, dependent on claim 1, is patentable over the Moureaux patent for the same reasons as discussed above. The Matsumoto reference, whatever it may teach, also does not describe or suggest this feature.

Claim 7 is thus patentable over the combination of the Moureaux and Matsumoto patents. Accordingly, Applicants respectfully request withdrawal of the rejection and reconsideration and allowance of claim 7.

Rejection Under 35 U.S.C. 103(a) over Moureaux in View of Smith

Claim 8 has been rejected as unpatentable over Moureaux, US Patent 5,036,110 in view of Smith et al., U.S. Patent 5,450,235. Applicants respectfully traverse the rejection and request reconsideration of the claim.

Claim 8, dependent on claim 1, is patentable over the Moureaux patent for the same reasons as discussed above. The Smith patent is cited for its teaching a combination of aromatic and aliphatic polyurethanes, which does not bear on hydrogen bonding between layers.

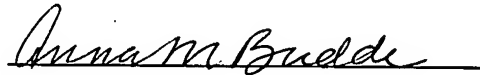
Claim 8 is thus patentable over the combination of the Moureaux and Smith patents. Accordingly, Applicants respectfully request withdrawal of the rejection and reconsideration and allowance of claim 8.

Conclusion

It is believed that all of the stated grounds of rejection and objection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections and objections. It is believed that a full and complete response has been made to the outstanding Office Action, and

as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. The Examiner is invited to telephone the undersigned if it would be helpful for resolving any issue.

Respectfully submitted,

A handwritten signature in cursive script, reading "Anna M. Budde", written over a horizontal line.

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